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10/822,700	04/13/2004	Naoto Matsunami	500.43772X00	2922

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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

> A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
> - Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
> - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
> - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
> Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>20 February 2007</u>.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-4, 6-12 and 14-20</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-4, 6-12, 14-20</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set for in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.1 14, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.1 14. Applicant's submission filed on 2/20/07 has been entered.

Claims 1-20 have been presented for examination in this application. In response to the last office action, claims 1,3,12,14 and 17 were amended, claims 5,13 have been canceled. As the result, claims 1-4,6-12,14-20 are now pending in this application.

Claims 1-4,6-12,14-20 are rejected.

Applicant's remarks filed 2/20/07 have been fully considered but they are mooted in view of new ground(s) of rejection necessitated by the Applicant's amendments to the claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1,3-4,6-9,12,14-15,17-20 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Murray e al (US 7007048) and further in view of Wong (US 2001/0051955).

As in claim 1, Murray discloses a first storage system connected network, via a network

to a computer and a second storage system (Murray's Fig 2 first storage system #22 connected

vie network such as switch #28 #48 to a computer #46 and second storage system such as #24),

comprising: a first storage device configured to a first file system (Muray's Fig 2: #22

configured to a first file system, host file system #62, Murray's column 6 lines 25-30); a first

controller for controlling said first system (Murray's Fig 2, column 6 lines 25-31, controller logic

of first storage system #22 for controlling host file system #62); and

a second controller for controlling input/output operations to/from said second storage system

(Murray's Fig 2: #54 IML controller, second controller, for controlling i/o operation to/from

second storage system #24, see Murray's column 6 lines 13-23); wherein said second storage

system includes a second storage device configured to a second file system and a third controller,

connected to said third controller, for controlling said second file system (Murray's Fig 2: #24

includes a second storage device configured to a second file system (Murray's Fig 3b: #66 IML

file system) and a third controller (Murray's Fig 3: #60 ILM head controller logic of the second

storage system #24), and

Murray does not expressly disclose the claim's details of mounting file system. However,

Wong's Fig 4 discloses a method of several file systems being mirrored across networks of

storage systems. It would have been obvious to one of ordinary skill in the art at the time of

invention to include the file system mirroring method to providing several copies of data to

several clients across the networks (Wong's paragraph 20) and thereby further to provide more

efficient and more reliable service to the clients across the networks (see Wong's paragraph 19 lines 26-34). Wong further discloses these file systems are being accessed using the typical known technique of mounting a remote file system (i.e mounting a root directory of the remote file system) at a mount point in the local file system in a single directory tree such that data in the these file systems are ready accessed by host connecting with the local file systems using the standard interface to perform the operations on the UFS/NFS file systems and their individual files or directories, see Wong's paragraphs 61-62; Wong's paragraph 67 further discloses two file systems mounting on a single directory).

As in claim 3, Murray discloses said first controller (Fig2 : controllers of first storage systems #22) is responsive to an access request for a file received from said computer (Fig 2: # 46) for identifying that a file system in which said file is stored is in said second storage (identifying and retrieving data in Fig 2: #24, second storage system #24 in response to a host request), and accesses a file stored in said second storage (accessing files in #24, see Murray's column 6 lines 21-40) through said second controller (Murray's Fig 2: #54, column 6 lines 6-23).

As in claim 4, Murray discloses wherein said second controller (Fig 2: #24) is connected to a plurality of second storage systems (Murray's Fig 2, several second storage systems #24, column 5 lines 3-15, connect to several ILM SAN storage sub-systems).

As in claim 6, Murray discloses wherein said first controller copies data in the first file system in said first storage device (Murray's Fig 2: #22) into said second storage device (Murray's Fig 2: #24) while maintaining the structure of said second file system (Murray's Fig 2, column 6 lines 23-32, first storage device #22 copying data in the first file system HFS SAN

into said second storage device #24, while maintaining the structure of said second file system

ILM File system).

As in claim 7, Murray discloses first controller copies the data in the first file system in

said first storage device into said second storage device, and thereafter erases the data in the first

file system in said first storage (Murray's column 9 lines 35-40, data in the first file system is

deleted after the data transferring is completed).

As in claim 8, Muray's column 8 lines 60 to column 9 line 4 further discloses the

controllers receiving a list of user data to be migrated from the host, controllers executing the

migration using FTP file transfer process and when the data transfer is completed, the controllers

set status to indicating to user that migration of user data is done. Murray does not expressly

discloses the prohibit write access aspect of the claim. However, the data for migration must not

be modified by the host processor during the migration/mirroring process so that the migration

process can complete in a timely manner.

As in claim 9, Murray discloses wherein said first storage system (Murray's Fig 2: #22)

is connected to a management device (Muray's column 7, lines 20-30 file system meta data

service in the controller #54 that contacts host's ILM shim to obtain the meta data, attribute for

the transferring) , such that said first controller copies the data in the first file system in said first

storage device into said second storage device (Murray's Fig 2, copying data from #22 to #24,

column 6 lines 5-31), and adds the attribute based on an instruction from said management

device (Murray's column 7 lines 48-57, adding file system's meta data information based on

instructions from the file system metadata service and using the information for subsequent data

transfer operations).

As in claim 12, Murray discloses a system for storing a file accessed by a computer,

comprising: a first storage system connected to said computer via a first network (Murray's Fig

2: #22 first storage network connected to computer #46); and

a second storage system connected to the first storage system via a second network (Murray's

Fig 2: #24 second storage network connected to firs storage system #22 via a second network,

#28), wherein the first storage system includes a first storage device configured to a first file

system (Murray's Fig 2: #22 having first file system, #62 host file system, see Murray's column

6 lines 25-32) , a first controller for controlling said first storage device and for providing the

first file system to the computer (Murray's Fig 2: controller #60 associating with storage

subsystem #22), and a second controller for controller for controlling input/output operations,

via the second network, to/from said second storage system (Murray's Fig 2: #54 second

controller, ILM controller), wherein said second storage system includes a storage device

(Murray's Fig 2: storage device in storage system #24) configured to a second file system

(Muray's Fig 2: #24, having second file system, ILM file system #66, see Murray's column 6

lines 32-34) and a third controller (Murray's Fig 2, third controller, controller of storage system

#24), connected to said second controller, for controlling said second file system (Murray's Fig

2, second controller, controller of storage system #22 for controlling data transferring from #22

to #24, see Murray's column 6 lines 38-55), and Murray does not expressly disclose the claim's

details of mounting file system. However, Wong's Fig 4 discloses a method of several file

systems being mirrored across networks of storage systems. It would have been obvious to one

of ordinary skill in the art at the time of invention to include the file system mirroring method to

providing several copies of data to several clients across the networks (Wong's paragraph 20)

and thereby further to provide more efficient and more reliable service to the clients across the

networks (see Wong's paragraph 19 lines 26-34). Wong further discloses these file systems are

being accessed using the typical known technique of mounting a remote file system (i.e

mounting a root directory of the remote file system) at a mount point in the local file system in a

single directory tree such that data in the these file systems are ready accessed by host

connecting with the local file systems using the standard interface to perform the operations on

the UFS/NFS file systems and their individual files or directories, see Wong's paragraphs 61-62;

Wong's paragraph 67 further discloses two file systems mounting on a single directory).

Murray further discloses wherein said second controller accesses, via the second network

and said third controller, the second file system created in said second storage system in response

to an access request for the second file system from said computer (Murray's column 6 lines 7-

40, controller #54 communicates with storage systems #22, #24 to direct all files transferring in

storage systems #22,#24 such as migration, replication etc..; including creating file system in the

second storage system (i.e target storage system) so that the second storage system can store

data from the first storage system in response to an access request from the computer, for

example copy on write service, see Murray's column 7 line 45 to column 8 line 12).

Claim 14 is rejected based on the same rationale as of claims 7 and 9. Murray further

discloses said first controller is responsive to an access request for said second file system from

said computer for controlling said second storage device to make an access thereto (Murray's Fig

2: #22 first storage system responses to access request from host computer, and further retrieving

data in the second storage system #24).

Claims 15,20 are rejected based on the same rationale as of claim 8.

Claim 17 is rejected based on the same rationale as of claim 6.

Claim 18 is rejected based on the same rationale as of claim 6.

Claim 19 is rejected based on the same rationale as of claim 7.

Claim 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murray e al (US

7007048),Wong (US 2001/0051955) as applied to claim 1 and in view of Bruning, III e all (US

2002/0035667).

As in claim 2, Murray and Wong do not expressly disclose the claim's aspect of the

RAID group. However, Bruning discloses a virtual volume method in which the storage system

manages the virtual volumes (Bruning's paragraph 6, manages data stored in virtual volumes (i.e

logical units) stripping data across group of RAID physical disks, Bruning's paragraph 9). It

would have been obvious to one of ordinary skill in the art at the time of invention to include

method and logic of managing the virtual volumes as suggested by Bruning in Murray's system

modified by Wong thereby further to provide user with a very large virtual storage system with a

built-in disaster tolerance capabilities thereby further ensure the data integrity in the very large

storage volumes (see Bruning's paragraph 4). Bruning further discloses the data in these

redundant RAID groups are created in first, second and third storage systems/devices (Bruning's

paragraph 16). Bruning further discloses data (i.e RAID group) in secondary storage device are

possessed by the first storage system, for example for copying data from the first storage system

to the second storage system Bruning's paragraphs 17, 19-20).

Claims 10,16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murray et al

(US 7007048),Wong (US 2001/0051955) as applied to claims 9 and 15, and further in view of

Kanellos (US 2003/0236788).

As in claim 10, Murray's column 7 lines 20-30 disclose various management services

(corresponding to the claim's management device) to manage meta data being used for data

transferring (file system meta data service, point-to-point management service, network resource

management service etc..). Murray and Wong do not expressly disclose the claim's aspect of

time management. However, Kanellos discloses a life cycle management method that having a

record manger for tracking and managing various stages of data/records in a storage system

(paragraphs 57) according to various policies applying for these data objects (paragraph 59). It

would have been obvious to one of ordinary skill in the art at the time of invention to include the

life cycle management method as suggested by Kanellos in Murray's system modified by Wong

and thereby data migration process of a storage system can be further scheduled ahead and latter

automatically commencing by the record manager (see Kanellos's paragraph 36).

Kanellos further discloses said management device sets a time at which a new file system

is configured in said storage; wherein said first controller creates a new file system in said first

storage device upon arrival of said time, and wherein said first controller stores data written from

said computer before said time into said second storage device; wherein said first controller

stores data written from said computer in said new file system (Kanellos's paragraphs 61, when a

file plan comprising of data in a file system to be moved, reaching a cut off date. A new file

system must be created, so that user can continue to write new data while the data in the file plan

is being moved); and moves a file system in said first storage device which has stored data

written from said computer before said time into said second storage device (Kanellos's

paragraphs 60,63,36 discloses of moving/transferring data to an external depository for data with

time earlier that the cutoff date).

Claim 16 is rejected based on the same rationale as of claim 10.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murray e al (US

7007048),Wong (US 2001/0051955), Kanellos (US 2003/0236788) as applied to claim 10 and in

view of Oliveira (US 6766359).

As in claim 11, none of Murray, Wong and Kanellos expressly discloses the claim's

management table. However, Oliveira discloses a method of transferring data files of file

systems among several host computers and storage systems (Olivera's Fig 2, Fig 3: #70 client

computer, #72 #74 servers for storage systems, see Olivera's column 7 line 65 to column 8 line

9), Olivera further discloses employing management table (Olivera's Fig 4) to manage the

structure of a file system such that several client's requests can be managed and processed

properly in a concurrent manner (Olivera's column 1 lines 55 to column 2 line 2). It would have

been obvious to one of ordinary skill in the art at the time of invention to employing

management table including various information associating with host requests suggested by

Olivera in Murray's system modified by Wong and Kanellos thereby several client requests can

be managed and processed properly in a concurrent manner (Olivera's column 1 lines 55 to

column 2 line 2).

Conclusion

When responding to the office action, Applicant is advised to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist examiner to locate the appropriate paragraphs.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duc T. Doan whose telephone number is 571-272-4171. The examiner can normally be reached on M-F 8:00 AM 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung S. Sough can be reached on 571-272-6799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

HYUNG SOUGH
SUPERVISORY PATENT EXAMINER   5-7-07